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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/928,316	08/13/2001	James E. Frey	528-009765-US (PAR)	7498
2512	7590	07/07/2004	EXAMINER SINGH, DALZID E	
PERMAN & GREEN 425 POST ROAD FAIRFIELD, CT 06824			ART UNIT 2633	PAPER NUMBER 2

DATE MAILED: 07/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/928,316

Applicant(s)

FREY ET AL.

Examiner

Dalzid Singh

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 August 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 13-20 is/are allowed.
- 6) ☒ Claim(s) 1-4 and 6-11 is/are rejected.
- 7) ☒ Claim(s) 5 and 12 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 August 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

1. In claim 2, applicant recites, "...the radio frequency equipment is located off the antenna." It is not clear what is meant by "off the antenna" Is applicant referring to location of the antenna relative to the equipment? Is the antenna to be at a particular distance from the equipment?

In claim 9, applicant recites, "...the antenna assembly comprises...radio frequency equipment for the antenna and located on from the antenna." It is not clear what is meant by "on from the antenna" Is applicant referring to location of the antenna relative to the housing?

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-3 and 6-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koonen (US Patent No. 6,674,966).

Regarding claim 1, Koonen discloses wireless network for linking data systems (14) and (74a), as shown in Fig. 7, comprising:

sensitive radio frequency (RF) equipment (in Fig. 7, Koonen shows sensitive radio frequency equipment, such as BTS, MUX/DEMUX and OPT TRX; it is well known

that electronic components are sensitive to radio frequency or RF signals; for example, electronic components, such as capacitors, inductors, or transformers, found in optical transmitter (OPT TRX) of Koonen are sensitive to radio frequency);

an antenna assembly located apart from the RF equipment (in Fig. 7, Koonen shows antenna assembly (74a) located apart from the RF equipment); and

a single fiber, bi-directional fiber optic link coupling the antenna to the RF equipment, wherein both RF signals and data signals can be sent across the data link (in Fig. 7, Koonen shows a single bi-directional fiber optic link (16) coupling the antenna (74a) to the RF equipment (14); the fiber is bi-directional since it transmit signal in two directions, shown by the arrows going into and out of WDM equipment (132); see also col. 9, lines 10-13, Koonen teaches transmission of signal in the upstream direction and downstream direction; signals coming from the antenna is considered as RF signal and signal coming toward the antenna is considered as data signals; wherein both RF and data signal are transmitted on the bi-directional fiber optic link (16)).

Koonen discloses the wireless network for linking data systems, as shown in Fig. 7, and differ from the claimed invention in that Koonen does not specifically disclose a shelter housing for the radio sensitive equipment. In wireless communication system, such as discussed above, the antenna is usually located outside on an open environment. Equipments or devices which transmit, receive and process signal coming to and going out of the antenna are usually located in the close proximity to the antenna. Environmental condition, such as excessive heat or damped condition, or electromagnetic radiation from the antenna, will add noise to data signal. Therefore, it

would have been obvious to an artisan of ordinary skill in the art to provide a housing to shelter the radio frequency equipment which are sensitive to environmental conditions. One of ordinary skill would have been motivated to do this in order to reduce or eliminate noise caused by such environmental conditions.

Regarding claim 2 (as far as understood), as shown in Fig. 7, Koonen shows that the radio frequency equipment is located away from the antenna (74a), (equipments, such as BTS, MUX/DEMUX and OPT TRX are located away or off from the antenna). It is assumed that applicant means "away from" since it unclear what "off the antenna" means.

Regarding claim 3, in Fig. 7, Koonen shows WDM or wavelength division multiplexer for the transfer of the RF signals and data signals (signals coming from the antenna is considered as RF signal and signal coming toward the antenna is considered as data signals).

Regarding claim 6, as shown in Fig. 7, Koonen shows WDM (132, wavelength division multiplexer) located in the equipment (14) and coupling signals passing across the fiber optic link (16) to and from other RF sensitive equipment in the antenna (74a), (in col. 9, lines 19-23, Koonen teaches the use of directional coupler implemented in multiplexer and demultiplexer for coupling signals across the fiber optic link to and from RF sensitive equipment in the antenna, such as OPT TX (76a or 78a)).

Regarding claim 7, in Fig. 7, Koonen shows that the RF sensitive equipment in 14 includes special transmitters and receivers for different wavelengths of signals passing across the data link (as shown in Fig. 7, Koonen shows optical transceivers

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such as OPT TRX (116) or OPT TRX (118), comprises of transmitter and receiver for transmitting and receiving different wavelength across the data link (16), see col. 10, lines 9-20).

Regarding claim 8, Koonen discloses wireless network for linking data systems as discussed above, and differ from the claimed invention in that Koonen does not specifically disclose that a shelter has an environment that is mild and dry. However, it is well known that operation of optical component such as laser diodes found in optical transmitter (OPT TRX) of Koonen is susceptible to variation in temperature. It is also well known that electronic components and the connection points are prone to rust and short circuit in a damped environment. Therefore, it would have been obvious to an artisan of ordinary skill in the art to place RF components of Koonen in a housing that is mild and dry and provide protection from environmental conditions. One of ordinary skill in the art would have been motivated to do this in order to prolonged operation lifespan of the equipment and maintained peak performance.

Regarding claim 9 (as far as understood), as shown in Fig. 7, Koonen shows that the antenna assembly (74a) comprises a radio frequency equipment assembly housing radio frequency equipment for the antenna (as shown in Fig. 7, the antenna assembly comprises radio frequency equipment, such as OPT TX (76a or 78a), which would obviously housed in a housing in order to protect the element from environmental conditions). It is assumed that applicant means "away from" since it unclear what "on from the antenna" means.

Regarding claim 10, in Fig. 7, Koonen shows that the antenna assembly (74a) includes wavelength division multiplexing (WDM) system.

4. Claims 4 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koonen (US Patent No. 6,674,966) in view of Cheong et al (US Patent No. 6,477,154).

Regarding claim 4, Koonen discloses wireless network for linking data systems comprising fiber optic cable, as discussed above, and differ from the claimed invention in that Koonen does not specifically disclose the system is adapted to send command link RF, return link RF, command and status signals over the fiber optical cable. However, in communication system it is well known to send command and status information signals. Cheong et al is cited to show such well known concept. In col. 7, lines 33-36, Cheong et al teach transmission or sending of control channel including a command signal. In col. 8, lines 10-12 and col. 10, lines 11-13, Cheong et al teach transmission of reverse link or return link and status information. As shown in Fig. 2 (215) and Fig. 6 (414), Cheong et al show that the link, which connects mBS and mBSC is a fiber optic link, since it carries optical signal such as λ_1 . The forward and reverse signal, which comprise of command and status signal is transmitted between mBS and mBSC over the fiber optic link. Therefore, it would have been obvious to an artisan of ordinary skill in the art to send command link RF, return link RF, command and status signals over the fiber optical cable as taught by Cheong et al to the system of Koonen. One of ordinary skill in the art would have been motivated to do this in order to provide centralized management of resources. Moreover, since the signal is transmitted to the

antenna and from the antenna (as shown in Figs. 2 and 6), therefore the signal is RF or radio frequency signals (see col. 8, lines 28-32).

Regarding claim 11, Koonen discloses wireless network for linking data systems comprising fiber optic cable, as discussed above, and differ from the claimed invention in that Koonen does not specifically disclose the system is adapted to send command link RF, return link RF, command and status signals over the fiber optical cable between the antenna assembly and the shelter. However, in communication system it is well known to send command and status information signals. Cheong et al is cited to show such well known concept. In col. 7, lines 33-36, Cheong et al teach transmission or sending of control channel including a command signal. In col. 8, lines 10-12 and col. 10, lines 11-13, Cheong et al teach transmission of reverse link or return link and status information. As shown in Fig. 2 (215) and Fig. 6 (414), Cheong et al show that the link, which connects mBS (i.e., antenna assembly) and mBSC (i.e., processor equipments for the antenna assembly which is obviously sheltered in order to protect from environmental conditions) is a fiber optic link, since it carries optical signal such as λ_1 . The forward and reverse signal, which comprise of command and status signal is transmitted between mBS and mBSC over the fiber optic link. Therefore, it would have been obvious to an artisan of ordinary skill in the art to send command link RF, return link RF, command and status signals over the fiber optical cable as taught by Cheong et al to the system of Koonen. One of ordinary skill in the art would have been motivated to do this in order to monitor operating condition of various devices. Moreover, since the signal is transmitted to the antenna and from the antenna (as shown in Figs. 2 and 6

of Cheong et al), therefore the signal is RF or radio frequency signals (see col. 8, lines 28-32 of Cheong et al).

Allowable Subject Matter

5. Claims 13-20 are allowed.
6. The following is a statement of reasons for the indication of allowable subject matter:

Claim 13 is allowed over the invention described in patent No. 6,674,966 to Koonen because the prior art does not disclose or fairly data link system adapted to carry command link and return link command and status comprising:

an enclosure coupled to the fiber optic link, and between the shelter and the antenna assembly, the enclosure including antenna motor controls and configurable add/drop multiplexers.

Claim 17 is allowed over the invention described in patent No. 6,674,966 to Koonen because the prior art does not disclose or fairly data link system comprising:

a fiber optic rotary joints adapted to pass the fiber optic link through antenna gimbals to the Radio Frequency Electronics, wherein command link radio frequency signals, return link radio frequency signals and command/status signals are passed over the single fiber.

Claims 5 and 12 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Tang (US Patent No. 5,339,184) is cited to show fiber optic antenna remoting for multi-sector cell sites.

Buabbud et al (US Patent No. 6,366,712) is cited to show apparatus and method for combining two separate RF signals on a single optical fiber with monitoring and alarm capabilities.

Yap (US Patent No. 6,724,523) is cited to show remotely locatable RF power amplification system.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dalzid Singh whose telephone number is 703-306-5619. The examiner can normally be reached on Mon-Fri 8am - 4pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on 703-305-4729. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DS

June 25, 2004

David Singh